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CHOOSING A DEDICATED COMMUNICATION DEVICE VERSUS A PERSONAL COMPUTER:
WHAT ARE THE DIFFERENCES AND WHAT DIFFERENCE DOES IT MAKE?

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In 1979 the Blissymbolics Communication Institute and the Blissymbolics Communication Service (now Augmentative Communication Service of the Ontario Crippled Children's Centre) were involved in assisting with the development of two dedicated communication devices: the Blissymbol Terminal and the Blissymbol Printer. It was judged important to be able to provide objective information regarding the devices' differing capabilities to potential users and a study was designed to evaluate the devices' communication functions by:

1. Collecting descriptive information about the environmental and user characteristics.
2. Evaluating the uses made of the aids in a variety of settings.
3. Evaluating the choice and organization of the vocabulary used in each of the aids.
4. Collecting instructional suggestions and ideas for teaching Blissymbol users how to employ each of the aids.

The study was financially supported by the Conn Smythe Research Foundation for Crippled Children from September 1979 to August 1981. It was undertaken when the equipment was at the prototype stage in the expectation that instructional manuals could be ready by time the production models of the two devices were available. It was hoped that the information gained through the experiences of the early users would provide a basis for a helpful introductory guide and thus facilitate effective use of the devices.

The prototype Blissymbol Terminal was developed by Norpak Inc., under contract from the National Research Council of Canada. When activated, it displayed Blissymbols on a CRT (cathode ray tube) screen, dividing the screen into 36 equal squares. The upper four rows of six symbols across were used as the display, reserving the lower two rows for the message. The symbol vocabulary was stored on 23 "pages" of meaning-based groups. Each page contained up to 24 symbols, and the total vocabulary included 512 symbols. The cursor, which could be controlled by several different interfaces, moved from square to square, allowing a selection to be made, first on the index page, secondly on the page containing the desired symbol.

The prototype Blissymbol Printer used within the study was a modified Autocom-E, produced by the Trace Centre. Through extra control electronics built into the original package and a printer mechanism built onto its top surface, the autocom printed Blissymbols. Over 800 symbols were available to the user. In July, 1981, the Trace Centre fitted the Telensory Systems Inc. production model of the Autocom, Model A1, with the necessary software to print Blissymbols. Although this model could not be evaluated during the 1979-1981 study, it is being evaluated within the BCI's vocational training program and within the Augmentative Communication Service of the Ontario Crippled Children's Centre.

The Blissymbol Terminal was placed in nine settings: two schools, a hospital, a residence, a summer camp and four homes. The Blissymbol Printer, as well, was placed in nine settings: three schools, a hospital, a camp, three homes and a summer cottage.

The study included 17 students ranging in age from eight to twenty-eight years. Prior to the study, all were relatively successful in communicating without a technical device (i.e. with a Blissymbol display or with limited speech); most of the students had been restricted in their range of social experiences. Information was gathered through questionnaires, videotapes and the recording of observations and evaluations of parents and subjects.

Midway through the study, upon the availability of the first version of the Blissapple⁽¹⁾, developed by the Trace Centre, Madison, a request was made to add the Apple to the Evaluation Study. During the fall of 1980, the Apple was purchased, interfaces were acquired and a computer literacy program was provided to the research and support staff. Student involvement with the Apple began in January, 1981.

The Apple shared with other personal computers, the ability to provide educational, vocational, recreational, telecommunication, networking and environmental control opportunities. Its memory, word processing, message sending and data management capabilities added to its Blissymbol program, made it a personal computer of particular interest to Blissymbol users.

In contrast to the Blissymbol Terminal and the Blissymbol Printer, the Apple was kept at the Ontario Crippled Children's Centre; the students came to the Centre to work on the Apple for sessions of two to five hours, one or two sessions per week.

All three devices made possible the storing of a complete Blissymbol message, allowing the user, time and independence for message construction and the opportunity of displaying the full message at the desired time. This tended to encourage the construction of more complete messages and users exhibited increased attention span and more independence. The receivers benefitted from having complete messages to interpret. The devices, no matter how successfully used, did not replace the method of pointing to a display. For private communications between a student and a familiar person, the student's former means of communication was still preferred. The devices did allow new ways of interacting, however, and opened up new communication possibilities to the students.

With the introduction of the Apple to the second year of the study, we were able to consider the differences between the dedicated communication device and the personal computer, and although the dedicated device's single function of communication contrasted dramatically with the many functions of the personal computer, we observed that, to the users and instructors, this made little difference.

(1) The Blissymbol disk allows the student to access 1400 Blissymbols and to organize them into appropriate user vocabulary. It is available in U.S.A. from the Trace Centre, 314 Waisman Centre, 1500 Highland Avenue, Madison, Wisconsin, 53706, \$35.00 (U.S.) and in Canada from Blissymbolics Communication Institute, 350 Rumsey Road, Toronto, Ontario, M4G 1R8, \$45.00 (Canadian).



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For the participants in the study, the questions that were important to them, related not to the expandability and potential range of uses of the device, but rather to the device's specific immediate functions.

- Could errors be corrected and how many control movements were required for correcting?

A critical function which strongly enhanced the usefulness of the communication device was that of correctability. When the intended message was visible to the user and capable of change, before it was viewed by the receiver or before it was printed, the device was more positively evaluated.

This capability was present with the Blissymbol terminal, with the Blissapple and with the first prototype model of the Blissymbol printer. It was not present in the second model of the Blissymbol printer.

- Was the device portable?

The device's potential for remaining with the user for as much time and in as many places as possible was an important consideration in evaluating the device's usefulness.

This capability was present in the Blissymbol printer, but not in the Blissymbol terminal or the Blissapple.

- Was the device programmable?

The opportunity to programme the device to accommodate the individual control and vocabulary needs of the user was a capability sought by all the instructors in the study.

The Blissapple gave high flexibility in this regard, accommodating many control approaches and providing user control over vocabulary selection and organization. The first Blissymbol Printer lacked user programmability, however, the second Blissymbol Printer gave user control over the selection and location of vocabulary items. Both printers were controlled like the Autocom with a magnetic interface. The Blissymbol Terminal had a fixed vocabulary, but did offer variety in the type of interface control which could be used.

- Was the display easy to view?

The ease with which the work area could be viewed was an important consideration in maintaining attention for long periods and in allowing the user to concentrate upon the message he/she wished to communicate.

The screen displays for the Blissymbol Terminal and the Blissapple were clear and functional for those with normal vision. With the Blissymbol Printer, the symbol could not be viewed until several additional symbols had been printed. This created problems for the user.

The questions most relevant to the research staff in device evaluation were:

- Was the technology at a level of versatility which was appropriate to the user's needs?

If the technology provided more capabilities than were required by the user and those in his/her environment, the device was not fully used and its functions were wasted.

- How much instruction to use the device effectively was necessary - both specific skill instruction and instruction directed toward a general understanding of the device's potential?

A large difference was observed in the amount of general and specific information that was required to effectively use the three devices.

For the Blissymbol Terminal and the Blissymbol Printer, vocabulary exercises, informal instruction relating to the interface and the vocabulary's paging system, and follow-up sessions to gain familiarity with the vocabulary were sufficient for comprehensive use of the device. This was undertaken by the student's regular instructor and the research instructor. For the Blissapple, it was judged necessary to provide a six-week orientation course in computer literacy and to introduce the use of the Apple personal computer through regular lessons with a computer-experienced instructor.

- How reliable was the device?

Critical to the acceptance of each of the devices, was the regularity with which it could be counted on to function.

Because the Blissymbol Printer and Blissymbol Terminal were prototype devices, much more difficulty was encountered with these aids. This adversely affected the instructor's and user's evaluation of them. The Apple was dependable when used by trained people.

- What servicing was available for the device?

The strong need to always have the use of a functional communication device, made availability of dependable servicing a very important consideration.

The Blissymbol Printer and Blissymbol Terminal both had to be returned several times to their developers for servicing, leaving the student for extended periods without device. The Apple could be serviced within 24 hours.

- Was there sufficient knowledge on the part of the instructor, both general and specific knowledge, to adequately use and give instruction in the use of the device?

The instructors' knowledge of language and cognitive development, their competence in diagnostic teaching, their awareness of the needs and potential of their students, their understanding of the differing capabilities of each of the devices, affected strongly their attitudes toward the devices and the progress of their students. Study showed that during this early stage of the implementation of microprocessor technology there is need for the instructor to have a strong base of knowledge in

she/he is to have the determination, ingenuity and vision to successfully teach effective use of the current devices.

- Were the attitudes of those with whom the user would interact, positive and accepting of things that are new?

In instances where there was not a confident willingness to try something new and to risk making a few mistakes, users were not highly motivated and the value of the device for that individual was reduced.

- Could sufficient time be devoted to gaining familiarity and competency with the device?

In cases where insufficient time and attention was given to the training and use of the device, the users did not achieve sufficient competency to realize the device's potential.

In general, the study helped us realize that regardless of the type of device being introduced, be it a dedicated communication aid or a personal computer, the most important factors relating to effective use were whether the capabilities which could be provided by the device were within the range of experiences known and valued by the user, the family and the instructor, and whether these capabilities could be relied upon to function consistently.

In considering the choice between a dedicated communication device and a personal computer our study indicated that the user, family and instructor need to consider:

1. the needs, capabilities and life experiences of the user;
2. the attitudes toward communication, technology and new experiences of the people within the environments in which the user functions;
3. the capabilities, maintenance and support systems of the device.

From our observations, it would seem that until the user and those in the community with whom the user interacts, become familiar with microprocessor technology and the many opportunities and choices it brings, the differences between a dedicated communication device and a personal computer make hardly any difference at all! There is a clear challenge for clinicians to become informed regarding the capabilities of this new technology and to develop effective ways of sharing this knowledge with those who will use it.

For further details regarding the evaluation of the Blissymbol Printer, the Blissymbol Terminal and the Apple personal computer, see:

1. Colquhoun, A., McNaughton, S., and Izzard, M., Report on the Evaluation of Blissymbol Communication utilizing the Blissymbol Printer, the Blissymbol Terminal and the Apple Personal Computer. Toronto: Conn Smythe Research Foundation for Crippled Children, 1982. Available from the Blissymbolics Communication Institute, 350 Rumsey Road, Toronto, Ontario, M4G 1R8.
2. Levy, R., and Waksvik, K., The Results of the Clinical Evaluation of the Blissterm and the Multiuser Classroom Communication System. Ottawa: National Research Council, 1981. Available from National Research Council, Ottawa, Ontario, K1A 0R8

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- Kelso, D. & Silverman, H. The Bliss-Com; A portable symbol printing communication aid. Proceedings of the Fourth Annual Conference on Systems & Devices for the Disabled, Seattle, Washington. 1977, June.

